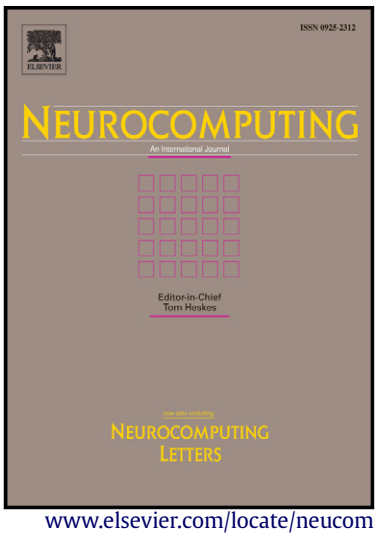
Author's Accepted Manuscript



www.elsevier.com/locate/neucom

Image-to-class distance ratio: A feature filtering metric for image classification

Shoubiao Tan, Li Liu, Chunyu Peng, Ling Shao

PII: S0925-2312(15)00281-7
DOI: http://dx.doi.org/10.1016/j.neucom.2015.03.011
Reference: NEUCOM15222

To appear in: *Neurocomputing*

Received date: 3 February 2015
Revised date: 26 February 2015
Accepted date: 3 March 2015

Cite this article as: Shoubiao Tan, Li Liu, Chunyu Peng, Ling Shao, Image-to-class distance ratio: A feature filtering metric for image classification, *Neurocomputing*, http://dx.doi.org/10.1016/j.neucom.2015.03.011

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

Image-to-Class Distance Ratio: A Feature Filtering Metric for Image Classification

Shoubiao Tan[a,b], Li Liu[c], Chunyu Peng[a], Ling Shao[c,*]

[a] *Key Laboratory of Intelligent Computing & Signal Processing, Ministry of Education, Anhui University, Huangshan Road, Hefei 230039, China*
[b] *Department of Electronic and Electrical Engineering, The University of Sheffield, Mappin Street, Sheffield, S1 3JD, UK*
[c] *Department of Computer Science and Digital Technologies, Northumbria University, Newcastle upon Tyne, NE1 8ST, UK*

Accepted manuscript

Abstract

A growing number of complex features are designed to address various problems in computer vision. Feature selection is an efficient way to reduce the heavy computation cost caused by complex and lengthy features. The total features are substituted by a discriminative subset selected according to a criterion to reduce the dimensionality. In current feature selection methods, most of the subset selection metric evaluate the features according to their relevance. However, the discriminative power of a feature subset is not simply determined by the relevance, especially in the case of complex features. In this paper, a new feature subset selection metric, the image-to-class distance ratio based on Euclidean distance, is proposed to select a subset in which the average intra-class Euclidean distance is minimized and average inter-class Euclidean distance is maximized, leading to good classification performance. In addition, the search space for feature selection problems with large-size complex features is huge, which makes many heuristic search methods infeasible. A Particle Swarm Optimization (PSO) based subset search algorithm is introduced to search the best subset according to the proposed metric in the huge search space. Experimental results show that the proposed subset search algorithm (I2CDRPSO) is effec-

*Corresponding author
Email address: ling.shao@ieee.org (Ling Shao)
URL: lshao.staff.shef.ac.uk (Ling Shao)

Download English Version:

https://daneshyari.com/en/article/6865721

Download Persian Version:

https://daneshyari.com/article/6865721

Daneshyari.com